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ABSTRACT

Information is provided explaining the incorporation of global issues units into an introductory earth science course at Skagit Valley Community College (Mount Vernon, Washington). First, a short description is provided of the original format of the earth science course, which was designed as an introductory level survey course covering topics in the areas of astronomy, geology, oceanography, and meteorology. Next, a definition of global issues is provided which identifies them as issues transcending traditional nation-state boundaries that are characterized by an incapacity for autonomous decision, a present imperative, a policy orientation, and persistence. Rationales are then presented for incorporating global issues in the curriculum and teaching them in a science class. The next section explains how the original course was modified to include global issues, tracing the chronology of the modification process and identifying the specific global issues covered in the course (i.e., basic concepts, population, human rights, food, energy, environment, military arms and security). The bulk of the document consists of appendices providing course materials, including the original earth science course outline; descriptions for the global issues units incorporated during the first quarter of implementation; an outline of the course as currently taught; a list of texts and references; an overview of the examination and evaluation procedures used; and a detailed outline of the "Population as a Global Issue" unit. (HB)

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Global Issues in an Introductory Earth Science Course

by James P. Pierce
Skagit Valley Community College
Mount Vernon, Washington

May 22, 1984

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JC 840 277

Global Issues in an Introductory Earth Science Course

The first part of this article will be a short description of the original form of the course that was modified into an Earth Science/Global Issues course followed by a definition and description of what characterizes global issues. The second part of the presentation describes how the course was converted; that is, what the chronology of the modification program was and what specific global issues were put into the course. An argument is presented for those particular issues working well in an introductory science course as well as the need to study/include global issues as part of the general program of study of all students in postsecondary education.

The Original Course:

Before Spring Quarter, 1983, Skagit Valley College's Earth Science 100 was an introductory level survey course covering, as the college catalogue states, "topics in the areas of astronomy, geology, oceanography and meteorology." The course was designed to fill 5 credits' worth of the 15 to 20 quarter credit hours of science required to earn Skagit Valley College's Associate of Arts degree. Holders of this degree are able to transfer into 4 year institutions in Washington State without transcript evaluation. The course is primarily for students who are not science majors. It meets for five lecture/discussions per week and for one 2 hour laboratory/quiz session per week. A list of the topics considered in the original course and the laboratory exercises covered is found in Appendix 1.

Anyone with knowledge of the development of science curricula during the last two decades or so will recognize this course as typical of science survey courses designed during the late 1960's. It was then commonly thought that science and mathematics should have introductory level courses especially designed

for non-majors. In the Washington state community college system, virtually every science department has chemistry 100, biology 100, natural science 100 and/or earth science 100. These courses were developed to introduce non-science majors to those fundamental concepts of science that would help them to be enlightened members of modern Western society, a culture that relies heavily on science and technology at virtually every level of its existence. How much success these survey courses have contributed toward accomplishing these goals is difficult to verify, and debate on the matter continues. Be that as it may, one aspect of these science survey courses that I, as an instructor, like is the flexibility of content that is possible with them. They do not have the standardized content array that, for example, freshman college chemistry has. Thus these survey courses can be among the most responsive courses in the undergraduate curriculum when change in the intellectual content of higher education occurs. That is why I elected to introduce global issues into my earth science survey course instead of my freshman chemistry course.

Definition of Global Issues:

Global issues are concerns of worldwide significance which once were largely matters of only personal, or perhaps national focus. How are global issues recognized and identified as such? First, one must think in terms of the globe itself. Global issues <u>transcend the traditional boundaries of the nation-state</u> or the regional group of nation-states. They are issues whose impact is felt beyond any regional confinement in terms of political or geographic space. They directly or indirectly affect the decisions and actions of large segments of the world's population. Global issues have the following characteristics:

First, they are characterized by an <u>incapacity for autonomous decision</u>. No single actor, or group of actors, has the capacity to resolve the issues

associated with, for instance, global population--its growth, the pace of that growth, or the placement of limits on either its pace or level of growth. The issue has become the target of a wide variety of governmental and non-governmental actors at all levels. These actors seldom work together. In fact, they often work in opposition to each other, and see the issue from very different perspectives. No single actor can resolve the issue alone. They must work out some compatible arrangement for resolution to be reached.

Second, global issues possess a present imperative. They press for immediate action toward resolution. Rapid population growth, for instance, has been viewed with alarm by the developed nations, especially the U. S. They view it as a serious potential threat to world peace. This has lent a growing sense of urgency to the developed nations' position regarding the issue.

Third, global issues require policy action for their resolution. This characteristic is not peculiar to global issues, but, added to the present imperative and incapacity for autonomous resolution properties, it helps in arriving at a full description of global issues.

A final element that characterizes global issues is their persistance. They've all been around awhile and show no signs of resolving themselves without help.

What scholars of the area agree upon as being the global issues of our time are: the global food system, the production, distribution and consumption of energy, world population, the deterioration of the global environment, economic interdependence of nations and world regions, development, especially of the third world, global armaments, security and war, human rights, and the linkages that exist among all of these issues.

The Need for Teaching Global Issues:

As Americans and as people who will inhabit this planet in the next century, we and our students must make ourselves aware of the dimensions and consequences of the fact that we have entered a new global era. We can no longer afford the insular, self-centered and provincial attitudes that we have largely operated from until now. We must, as citizens of the wealthiest nation in the world, develop a global outlook if we are to survive. We live in a shrinking world. The foreward rush of technology and trade is rapidly canceling out the cushioning effect of the space that once separated cultures and nations. This has brought about a rapid increase of global interdependence. Personal coping capacities, local and national concerns and careers at all levels increasingly reflect this global interdependence. These global issues affect us all because they make our local concerns globally dependent. Our gasoline supply and its price, for example, is dependent on a global energy system, its development, its economics and its politics. The introduction of global issues and a global view into the curriculum of American education at any and all appropriate levels is the educational cause of the 1980's.

A Justification for Teaching Global Issues in a Science Class:

Why should global issues be placed in an earth science course? First, not all global issues can be treated best from a scientific perspective. Some are far more properly considered from a political, economic or sociological/anthropological perspective than from anything close to a physical or biological scientific treatment. However, there are some global issues, noteably the issues of food, energy, population and the environment that can be quite properly studied from a scientific perspective.

To the more conservative science instructor, the placement of these topics into a basic earth science course may seem to constitute straying from "hard

science" into areas best left to the social scientist or even the humanist. That the course, as modified, goes heavily into human activities on the global scale is very true and that, I maintain, is part of earth science. Furthermore, I am convinced that not only can the principles of scientific analysis be as well taught via an analysis of, for instance, the demographic transition model as via the tectonic plate theory, but also that the information contained in the demographic transition model is far more useful and necessary to the average citizen than that contained in the tectonic plate theory.

In the late 1960's, Alvin Toffler, in his pioneering work Future Shock, pointed out that one of the symptoms shown by members of societies suffering from future shock was their reaction to what he called overchoice--too much to select from in all areas. This caused a wide variety of strategies to be developed that effectively reduced or fended off the number of choices people had to make. In 1982, John Naisbitt, in his book Megatrends, pointed out that the present generation of American young adults is the first generation in our history to be less educated than its parents. I suggest that this is a specific example of one generation's reaction to overchoice. This generation has deliberately rejected too much of the vast amounts of information to which it has access. Educators have at least two fundamental problems: deciding what should be learned and assisting that learning to occur. Often we forget that, in our present information-oversaturated society, the first of these problems takes on an especial importance. We must make careful choices about what is to be taught in our classes. I've decided that basic information about global issues is extremely important for the mainstream student to have and that many global issues can be very well taught from a scientific base.

Advocates of putting global perspectives into the programs of United States higher education have taken at least one lesson in what not to do from their

predecessors. The educational cause of the 1960's was the area of civil rights, minority affairs and ethnic studies; in the '70's it was women's studies and rights. In both instances, specialists in these areas built their own segregated curricula and courses and formed their own departments. In other words, they put themselves out on isolated branches of the academic tree, thereby setting themselves and their disciplines up to be pruned out at some later time. This is presently happening in many areas to both disciplines.

The proponents of opening up the view of post-secondary education to global perspectives advocate doing this by infusing global perspectives into presently existing courses and programs rather than through the development of new courses and/or programs. That is, we wish to infiltrate the very trunk of the academic tree rather than to grow our own branch to be sawed off at the first drought.

How the Original Course was Modified to Include Global Issues:

I was recruited to the cause when my institution became a member of what was then called the Pacific Northwest International/Intercultural Education Consortium, now the Northwest International Education Association (see Change Magazine, May-June, 1980). The consortium had acquired a Title VI grant for the improvement of international studies and foreign language education at the post-secondary level. One of the grant's objectives was to promote the introduction of global perspectives into the curriculum of as many of the consortium's member institutions as possible. I received a minigrant from this project to develop a global issues approach to my earth science 100 course. That is how it all came to pass.

I started the modification project during the summer of 1982, and continued working on the course during fall quarter of that year. The fully modified course was tried first in spring quarter, 1983. An outline of the course contents is shown in Appendix 2.

After teaching the course for one quarter with the material shown in Appendix 2 and analyzing test results, student opinion surveys and reviewing the objectives of the course as part of Skagit Valley College's total curriculum, I decided that I had gone a bit too far into socio/political areas for a lab science course with the units on World Armaments and Security and Human Rights. I removed them from the course and replaced them with a beginning unit on solar system astronomy, the earth's motion, internal composition, the composition of the earth's crust (minerals and rocks), weathering, erosion and the formation of soils and soil types. This would lead naturally, I hoped, into the unit on food, which leads to the unit on population, which leads to the unit on energy and the environment. That is about as far as a ten instructional week quarter allows me to go. An outline of the course as I am presently teaching it is shown as Appendix 3.

The course, as shown in Appendix 3, has been taught five times during Fall, Winter and Spring quarters, 1983 and 1984 on both the main campus and one branch campus of Skagit Valley College. Enrollment has varied from 8 to 48 students per class. It shows every sign of being a healthy and viable course.

The texts and references I have used for the course are listed in Appendix 4. My examination and evaluation procedure is outlined in Appendix 5. My teaching procedure is basically that of the lecture/discussion method. At the beginning of each unit, I give each student a copy of the unit's topics, reading assignments, time schedule, laboratory assignments, objectives and an outline of the lecture material for use in note taking. See Appendix 6 for an example--the Population Unit outline.

Conclusion:

The course has been made into a study of the earth, its fundamental place in human activities, the problems, the economics, politics and sociology involved,

and the importance of these earth-related issues to all humanity. As V. V. Raman states in the "Point of View" section of the April 4, 1984 Chronicle of Higher Education, "I contend that science should be taught not simply as a body of useful knowledge clothed in technical vocabulary but . . . as an intellectual framework to guide us in the adoption of tentative interpretations of what is observed, and as a world view that is not ultimate truth but is applicable and acceptable only in the context of a given set of available facts. If that point of view is also encouraged in situations beyond technical problems, we may see a world where there is less dogmatism and greater mutual understanding." A very good way to work toward accomplishing this is through a study of global issues from a scientific perspective.

Earth Science 100
Course Outline
James Pierce, Instructor

Introduction:

1. Class Meeting Schedule:

   a. Class time and place

   b. Laboratory time and place

   c. Exceptions.
      (Instructor off campus, etc.)_____

2. Books and supplies needed:

   a. Textbook

   b. Lab Manual

   c. Supplies_____

3. Books and audiovisuals used in class presentations. Those are available through the library/media center reserve desk.

   a. The Earth: Man's Geological Environment This is a filmstrip audio cassette package consisting of seven modular presentations. They are used quite heavily in classroom presentations. The authors are George D. Brown, Jr. and George T. Ladd. The package, with explanatory text, is published by Chas. E. Merrill Publishing Company, Columbus, Ohio.

   b. The following films are permanently kept in our library and may be viewed, or reviewed by students on an appointment basis. Each will be shown one time during classroom programs.

      i. The Earth's Interior The Open University (S100 U 22)
      Walton Hall, Bletchley, Buckingham
      U.K.

      ii. Continental Drift and Seafloor Spreading
      The Open University Press (S100
      Walton Hall, Bletchley, Bucks
      U.K.

      iii The Present is the Key to the Past
      The Open University Press (S100
      Walton Hall, Bletchley, Bucks
      U.K.

      iv. Record in the Rocks The Open University Press (S100
      Walton Hall, Bletchley, Bucks
      U.K.

      v. The Beach: A River of Sand Encyclopedia Britannica

      vi. Volcano Surtsey

3. (continued)

c. These films will be brought on campus on a rental basis for an in-class showing as part of the scheduled class activities. They are usually available for review for a day or two after their use in class through the library's media desk on an appointment basis.

i. The Hidden Earth Encyclopaedia Britannica Films, Inc.

ii. The Shape of the Earth " " "

iii. Erosion: Leveling the Land " " "

iv. Why do we Still Have Mountains?" " "

v. Evidence for the Ice Age " " "

vi. Secrets of the Ice " " "

vii. Rocks that form at the Earth's Surface " "

d. These audiocassettes are on permanent reserve at the media desk in the library and may be checked out and heard at the student's convenience. They add much to the classroom and reading assignment materials. They will be assigned listening for out-of-class work.

1. Nuclear Explosion and Natural Earthquake (S100/22) The Open University Press discusses the development of world-wide seismic station interlinkage as a direct result of monitoring the conditions of the nuclear test ban treaties.

ii. The Finite Earth (S100/23) The Open University Press discusses the limited nature of the planet's natural resources

iii. Revolution in the Earth Sciences (S100/25) The Open University Press discusses the impact of the Continental Drift-Seafloor Spreading-Plate Tectonics theory on the earth sciences.

4. This course is subdivided into five Modules. Each module consists of an interrelated group of topics for consideration in the classroom and the laboratory. There will be one classroom examination and one laboratory quiz terminating each Module. It will take approximately two weeks to go through each Module. The course will end with a comprehensive final examination over all Modules. The Modules, their topics, and the accompanying reading, listening, and viewing assignments are listed below:

Module 1 Topics covered:

a. Formation of the Solar System and the Earth (The Dust Cloud Hypothesis)
b. The internal structure of the Earth as a model based on earthquake wave analysis
c. The composition of the Earth's crust (elements, minerals and rocks)

i. Read these: (out-of-class activity)
Tarbuck and Lutgens: Chap 17, pp 397-417
Chap 5, pp 101-118
Chap 1, pp 3-26

2. View these: (in-class activity; reviewable)
Brown and Ladd: Module 1 (filmstrip-cassette)
The Earth's Interior (film)
Shape of the Earth (film)
Hidden Earth (film)

3. Listen to these: (out-of-class activity)
Nuclear Explosion and Natural Earthquake (S100/22) (audiocassette)

4. Do in the laboratory:
Study pp 1-29 in Zumberge/Rutford. Do exercises 1-4, included in pp 1-29. We will take two laboratory periods doing this.

4. (Continued)

Module 2 Topics covered:

A. Gravity, heat, geomagnetism and earthquakes
B. Volcanoes and vulcanism
C. Continental drift, sea-floor spreading and plate tectonics

i. Read these:
Tarbuck and Lutgens: Chap 5-8, pp 101-184

ii. View these:
Brown and Ladd: Module 2 & 3 (filmstrip-audiocassette)
Volcano Surtsey (film)
Continental Drift and Seafloor Spreading (film)
Why do We Still Have Mountains? (film)

iii. Listen to these:
Revolution in the Earth Sciences (S100/25)
(audiocassette)

iv. Do in the laboratory:
Part 2, study from page 31 through page 46, doing exercises 5 through 8 in Zumberge/Rutford.
We will take two laboratory periods for this work.

Module 3 Topics covered:

A. Weathering and soils
B. Erosion and erosion agencies
C. Deposition and deposition agencies

i. Read these:
Tarbuck and Lutgens: Chap 2-4 pp29-99.
James Risser: "A Renewed Threat of Soil Erosion: It's Worse than the Dust Bowl", in Smithsonian, Volume 11, No. 12, March

ii. View these:
Brown and Ladd: Modules 4 and 5 (filmstrip-audiocassette)
Erosion: Levelling the Land (film)
Rocks that Form at the Earth's Surface (film)

iii. Listen to these: no assignment

iv. Do in the laboratory: Study pp 47-64 in Z/R.
Do exercises 9, 10A, 10B, 11A and 11B. We will take two laboratory periods for this work.

Module 4 Topics covered: (this module takes only about one week)

a. The Geologic time scale
b. Plant and animal evolution as deduced from fossil evidence and Darwin's theory of evolution

i. Read these:
Tarbuck and Lutgens: Geologic time and Earth History. Chapter 9, pp 187-207

ii. View these
Brown and Ladd: Module 6 (filmstrip-audiocassette)
The Present is the Key to the Past (film)
Record in the Rocks (film)

iii. Listen to these: no assignment

iv. In the laboratory: Fossils a hand-out type exercise

Module 5 Topics covered:

a. Environment, Minerals and Soil resources, Water and Land resources, Energy
b. Life on the Earth's surface
c. Problems resulting from natural geological processes
d. Social, economic and political problems that pertain to the planet and its resources.

1. Read these: no assignment

2. View these:
Brown and Ladd: Module 7 (filmstrip-audiocassette)

3. Listen to these: The Finite Earth (audiocassette)

4. In the laboratory:
The Sea of Plenty, a simulation game where students represent fictional 1st, 2nd and 3rd world nations conferring and negotiating about environmental, political and economic issues based on a sea they share a common interest about.

The Banana Game: (if time allows) A simulation around negotiations among banana republics and multinationals

GLOBAL ISSUES

Unit I Basic Concepts

Class Scheduling: Ten (10) one hour class meetings and two 2 hour laboratory/discussion periods

Topics treated:

A. What is a Global Issue?

B. Why study Global Issues?

C. Who are the Actors?
   i. Political actors
   ii. sociological/psychological actors

D. Some basic concepts in Economics.

Objectives:

Students successfully completing this Unit should be able to:

1. List or recognize correct listings of the five major characteristics of a Global Issue.
2. List and discuss or recognize correct lists and discussions of at least five specific and valid reasons why an understanding of global issues is important.
3. Define and/or recognize correct definitions of: Third World, Second World, First World, Multinational Corporation, Cartel.
4. Locate several representative third, second and first world nations on a world map.
5. List and discuss and/or recognize correct lists and discussions of 4 influences on an individual's or culture's view of the universe.
6. Define and/or recognize a correct definition of economics.

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Unit II Population as a Global Issue

Class Scheduling: 10 class hours and two 2 hour laboratory-discussion periods.

Topics treated:

A. Population in the U.S.A.

B. Population Factors

C. World Population Trends

D. Why population growth is an issue

E. Population plus"_____" problems

F. Population Actors

G. Population Values

H. Population Policies

I. Population Futures

Objectives:

Students successfully completing this Unit should be able to:

1. Cite two reasons for considering population a global issue.
2. Cite six population problems now present in the U.S.A.
3. Cite three process variables effecting population.
4. Explain and/or use:
   $P^{now} = P^{then}$ + births - deaths +(in-migration - out-migrat.)
5. Cite the three structural variables populations may have.
6. Describe present general trends in world population change.
7. Cite the "rule of 70"
8. compare and contrast 20th century population growth with that of the 19th, 18th and 17th centuries.
9. Compare and contrast the population growth of the developed and the developing world.

FOOD AS A GLOBAL ISSUE

Class Scheduling: Ten class hours and two 2 hour laboratory/discussion periods.

Topics treated:

A. Three basic Food Questions
   1. Must there be hunger?
   2. What is Food?
   3. Who is hungry?
B. Five Global Food Problems
   1. Food shortages
   2. Instability of food supply
   3. Security of food imports
   4. Low agricultural productivity in the developing world (LDC's, or Third World)
   5. Malnutrition
C. The Global Food System
D. Food actors
E. Food Values
F. Food Policies
G. Food Futures

Objectives:

Students successfully completing this Unit should be able to:

1. Validly discuss and/or recognize valid discussions of world hunger in terms of world food supply, distribution, starvation and malnutrition.

2. Describe the definitions of food used when it is considered a commodity and when it is considered a nutrient.
3. Describe who the chronically hungry of the world tend to be.

4. List the five global food problems.

ENVIRONMENT AS A GLOBAL ISSUE

Class Scheduling: Five one hour class sessions and one two hour lab/discussion section.

Topics treated:

A. Environment as a Global Issue

1. Ecosystem

2. Carrying Capacity

3. tragedy of the commons

B. Historical Overview
   1. Different cultural views of nature and society
   2. Evolution of global threats to the biosphere

C. Contemporary environmental problems and dilemmas.
   1. Difficulties in analyzing Environmental problems
   2. Current global threats and limits

D. Responses to global environmental threats since WWII

Reading Assignment:

Chapter 1 of _____, by _____, pp13-43, "Environment as a Global Issue" (Handout)

Laboratory Activity:

The Ocean Resources Game (handout)

Environment As A Global Issue--Lecture outline.

I. Environment as a Global Issue.

A. Environment and resources not limited by political boundaries

B. Ecological and Environmental terms

ENERGY AS A GLOBAL ISSUE

Class Scheduling: Five one hour class periods and one 2 hour laboratory/discussion period.

Topics treated:

A. Energy Awareness

B. History of Energy Useage and Fuel Useage in the Developed World.

C. Evolution of the World Energy System.

D. History of Energy Use in the U.S.A.

E. Energy Sources: basic information

1. Energy measurement

2. Coal

3. Oil and natural gas

4. Hydroelectricity

5. Nuclear Power

6. Electricity

F. The Energy Crisis of the 1970's

1. historical background

2. immediate causes

3. response

GLOBAL ISSUES

Unit I Basic Concepts

Class Scheduling: Ten (10) one hour class meetings and two 2 hour laboratory/discussion periods

Topics treated:

A. What is a Global Issue?

B. Why study Global Issues?

C. Who are the Actors?
   i. Political actors
   ii. sociological/psychological actors

D. Some basic concepts in Economics.

Objectives:

Students successfully completing this Unit should be able to:

1. List or recognize correct listings of the five major characteristics of a Global Issue.
2. List and discuss or recognize correct lists and discussions of at least five specific and valid reasons why an understanding of global issues is important.
3. Define and/or recognize correct definitions of: Third World, Second World, First World, Multinational Corporation, Cartel.
4. Locate several representative third, second and first world nations on a world map.
5. List and discuss and/or recognize correct lists and discussions of 4 influences on an individual's or culture's view of the universe.
6. Define and/or recognize a correct definition of economics.

Unit II Population as a Global Issue

Class Scheduling: 10 class hours and two 2 hour laboratory-discussion periods.

Topics treated:

A. Population in the U.S.A.

B. Population Factors

C. World Population Trends

D. Why population growth is an issue

E. Population plus"_____" problems

F. Population Actors

G. Population Values

H. Population Policies

I. Population Futures

Objectives:

Students successfully completing this Unit should be able to:

1. Cite two reasons for considering population a global issue.
2. Cite six population problems now present in the U.S.A.
3. Cite three process variables effecting population.
4. Explain and/or use:
   $P^{now} = P^{then}$ + births - deaths +(in-migration - out-migrat.)
5. Cite the three structural variables populations may have.
6. Describe present general trends in world population change.
7. Cite the "rule of 70"
8. compare and contrast 20th century population growth with that of the 19th, 18th and 17th centuries.
9. Compare and contrast the population growth of the developed and the developing world.

HUMAN RIGHTS AS A GLOBAL ISSUE

Class Scheduling:

2 to three 1 hour class sessions and one two hour lab/discussion section.

Topics treated:

A. Definitions of Human Rights

B. The U. N. Universal Declaration of Human Rights.

C. The Evolution of Human Rights.

D. Human Rights Case Studies.

E. Human Rights monitoring organizations

Reading Assignments:

pp. 189-212 in text.

Lab/discussion activity

Activities three and four, pp.202-211 in text.

Objectives:

Students successfully completing this Unit should be able to:

1. Demonstrate and understanding of the cultural and political biases present in an individual's view of what constitutes human rights.

2. Describe and cite examples of the First, Second, and Third World's approaches to human rights.

3. Demonstrate knowledge of the U.N. Universal Declaration of Human Rights.

FOOD AS A GLOBAL ISSUE

Class Scheduling: Ten class hours and two 2 hour laboratory/discussion periods.

Topics treated:

A. Three basic Food Questions
   1. Must there be hunger?
   2. What is Food?
   3. Who is hungry?

B. Five Global Food Problems
   1. Food shortages
   2. Instability of food supply
   3. Security of food imports
   4. Low agricultural productivity in the developing world (LDC's, or Third World)
   5. Malnutrition

C. The Global Food System

D. Food actors

E. Food Values

F. Food Policies

G. Food Futures

Objectives:

Students successfully completing this Unit should be able to:

1. Validly discuss and/or recognize valid discussions of world hunger in terms of world food supply, distribution, starvation and malnutrition.

2. Describe the definitions of food used when it is considered a commodity and when it is considered a nutrient.

3. Describe who the chronically hungry of the world tend to be.

4. List the five global food problems.

ENERGY AS A GLOBAL ISSUE

Class Scheduling: Five one hour class periods and one 2 hour laboratory/discussion period.

Topics treated:

A. Energy Awareness

B. History of Energy Useage and Fuel Useage in the Developed World.

C. Evolution of he World Energy System.

D. History of Energy Use in the U.S.A.

E. Energy Sources: basic information

1. Energy measurement

2. Coal

3. Oil and natural gas

4. Hydroelectricity

5. Nuclear Power

6. Electricity

F. The Energy Crisis of the 1970's

1. historical background

2. immediate causes

3. response

ENVIRONMENT AS A GLOBAL ISSUE

Class Scheduling: Five one hour class sessions and one two hour lab/discussion section.

Topics treated:

A. Environment as a Global Issue

1. Ecosystem

2. Carrying Capacity

3. tragedy of the commons

B. Historical Overview
   1. Different cultural views of nature and society
   2. Evolution of global threats to the biosphere

C. Contemporary environmental problems and dilemmas.
   1. Difficulties in analyzing Environmental problems
   2. Current global threats and limits

D. Responses to global environmental threats since WWII

Reading Assignment:

Chapter 1 of _____, by _____, pp13-43,
"Environment as a Global Issue" (Handout)

Laboratory Activity:

The Ocean Resources Game (handout)

Environment As A Global Issue--Lecture outline.

I. Environment as a Global Issue.

A. Environment and resources not limited by political boundaries

B. Ecological and Environmental terms

MILITARY ARMS AND SECURITY AS A GLOBAL ISSUE

Class scheduling: Five one hour class sessions and one two hour Lab/discussion period.

Topics treated:

A. Reason(s) for the need for arms.

B. Destructive Capacity: an Example

C. World Military Growth

D. Willingness to use Arms

E. First and Second Strike Capability

F. Limiting Arms
   1. The Antarctic Treaty
   2. The Nuclear Test Ban Treaty
   3. Space Exploration Treaty
   4. Nuclear non-proliferation Treaty
   5. Nuclear Prohibition on Seabed and Ocean Floor Treaty
   6. Bacteriological and chemical Weapons ban Treaty
   7. SALT I
   8. U.S.A.-USSR Weapons Limitations Treaties
   9. SALT II

Reading Assignment:

pp. 213-276 in Text.

Lab/discussion activities:

Activities 1, 2 and 3 in text reading assignment

4. This course is subdivided into five Modules. Each module consists of an interrelated group of topics for consideration in the classroom and the laboratory. There will be one classroom examination and one laboratory quiz terminating each Module. It will take approximately two weeks to go through each Module. The course will end with a comprehensive final examination over all Modules. The Modules, their topics, and the accompanying reading, listening, and viewing assignments are listed below:

Module 1 Topics covered:

a. Formation of the Solar System and the Earth (The Dust Cloud Hypothesis)
b. The internal structure of the Earth as a model based on earthquake wave analysis
c. The composition of the Earth's crust (elements, minerals and rocks)

i. Read these: (out-of-class activity)
Tarbuck and Lutgens: Chap 17, pp397-417
Chap 5, pp101-118
Chap 1, pp3-26

2. View these: (in-class activity; reviewable)
Brown and Ladd: Module 1 (filmstrip-cassette)
The Earth's Interior (film)
Shape of the Earth (film)
Hidden Earth (film)

3. Listen to these: (out-of-class activity)
Nuclear Explosion and Natural Earthquake (S100/22) (audiocassette)

4. Do in the laboratory:
Study pp 1-29 in Zumberge/Rutford. Do exercises 1-4, included in pp 1-29. We will take two laboratory periods doing this.

Appendix 4: Texts and References

Texts:

The Earth, Man's Geological Environment, by G. D. Brown and G. T. Ladd, Charles E. Merril Publishing Co., 1976. (This book has a very helpful filmstrip/audio cassette set that accompanies it).

Food in the Global Arena, by Hopkins, et.al., Holt, Rinehart and Winston, 1982
ISBN 0-03-060062-6

Population in the Global Arena, by Marden, et.al., Holt, Rinehart and Winston, 1982
ISBN 0-03-060061-8

References:

Energy Resources and Environment, by John W. Christensen, Kendall/Hunt Publishing Co., 1981
ISBN 0-8403-2473-1

Physical Geology, by Plummer and McGeary, 2nd ed., Wm. C. Brown Co., 1982
ISBN 0-697-05038-6

The Earth's Interior, Unit 22 of the Open University's Science 100 course, The Open University Press, 1971
SBN 335-0235-6

Earth Science 100/Global Issues-- Grading Procedure:

The Grade you receive for this course is based on the following factors:

Examinations: 3 or 4 unit exams of 40 to 60 questions each plus a comprehensive final of 60-100 questions will be given during the quarter. All questions will be multiple choice, true-false or matching. You will need a green grading machine answer card for each exam. ---70% of your final grade will be based on these examinations.

Laboratory exercises and/or simulations:

Examples: Data tables and Graphs lab and The Shoe Industry simulation. These will be evaluated on a basis of 10 points per exercise. They will be evaluated on completeness, clarity and the apparent degree of thought that went into their preparation. They will be scored on a 10 point per exercise basis. Their total will make up 20% of the final grade. Failure to do all of them will constitute failure to complete course requirements and is grounds for course failure.

Surveys: Examples: Your Global Connection and Headlines will be credited at five points each and will be credited on the basis of completion and return. Survey total makes up 10% of the final grade.

Attendance: You may miss as many as 5 days (10%) of the class meetings and 1 of the lab sessions (10%) without penalty. However, missing more than that will cost 1% off the student's final grade percent per class or lab hour missed. Missing more than 10 class days or/and 2 lab sessions will necessitate a review discussion between student and instructor to decide whether the student should continue in the course.

Papers: may be undertaken on an individual basis as a makeup or extra credit project by arrangement with the instructor.

Final grade percentage scale:

100-90% = A

89-80% = B

79-65% = C

64-50% = D

49-?% = E

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Status Report.

Name_____ Course_____ Date_____

Exams _____ _____ _____ _____ _____ x _____ = _____

Laboratories surveys and extra credit

_____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ x _____ = _____

Attendance effect _____ days absent = _____ percentage effect = _____

final percentage as of now = _____

grade that would be given if grades were given now. _____

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Unit II Population as a Global Issue

Class Scheduling: 10 class hours and two 2 hour laboratory-discussion periods.

Topics treated:

A. Population in the U.S.A.

B. Population Factors

C. World Population Trends

D. Why population growth is an issue

E. Population plus"_____" problems

F. Population Actors

G. Population Values

H. Population Policies

I. Population Futures

Objectives:

Students successfully completing this Unit should be able to:

1. Cite two reasons for considering population a global issue.
2. Cite six population problems now present in the U.S.A.
3. Cite three process variables effecting population.
4. Explain and/or use:
   $P^{now} = P^{then}$ + births - deaths +(in-migration - out-migrat.)
5. Cite the three structural variables populations may have.
6. Describe present general trends in world population change.
7. Cite the "rule of 70"
8. compare and contrast 20th century population growth with that of the 19th, 18th and 17th centuries.
9. Compare and contrast the population ~~growth of the developed~~ and the developing world.

Objectives (cont.)

10. Compare and contrast the population growth rates of developed and developing nations, and the birth and death rates of developed and developing nations.
11. Explain the demographic transition model.

12. Use the demographic transition model to explain the differences between the growth rates of the populations of the developed nations and the developing nations.

13. Recognize age-sex pyramid representations of low, medium and high fertility populations.

14. Describe the five population plus "_____" problems and cite examples of each.

15. List representatives of groups who hold views that are extreme and moderate population values.

16. Describe examples of the major shapers of p-pulation policies in the developing (third) world. Describe who are antinatalist, who are pronatalist, who are international bodies, who are national groups and who are subnational.

17. Describe the historical and present role of the U.S.A in the development of global population policy.

18. List the major outcomes of the U.N. World Population Conference held in 1974 in Bucharest, Romania

19. Describe the role(s) of multinational corporations in population matters.

20. Describe the influence of The Ford Foundation, The Rockefeller Foundation, and the Population Council on global population policies.

21. Describe the role of the U.S. government, operating through AID, in population control policy development.

22. List and describe some subnational actors who influence the formation of population policy.

23. Describe how the battle between pronatalist and antinatalist forces has shaped up.

24. Describe the Marxist-Leninist position on population matters and the application of that position in:
    a. the USSR
    b. mainland China

25. List the agencies that generate world population projections.

26. Describe the mortality projections presently made for the developing world and the developed world through 2000 AD.

27. Describe the birth rate projections presently made for the developed and the developing worlds through 2000 AD.

28. Describe the population increase rate projections presently made for the developing world and the developed world through 2000 AD.

29. Describe the major conclusions drawn from the projections mentioned in objectives 26,27 and 28.

Reading Assignment:

Chapter 2 of Understanding Global Problems, by Harf and Trout, pp. 27-69. (Textbook)

Chapters 2, 3 and 5 of Population in the Global Arena, by P.G. Marden, D.G. Hodgson, and T.L. McCoy.

Ch. 2--"Population Actors"--pp37-59
Ch. 3--"Population Values"--pp60-76
Ch. 5--"The Future of Population"--pp109-135.

(Population in the Global Arena is a supplemental book used in the course. It may by purchased at the student's option from the college bookstore or it may be checked out from the reserved book section of the library.)

Laboratory/Discussion section activities:

Lab. 1:

Students should bring their completed Personal Profile to lab and a class composit will be developed. (pp42-44 of text, Activity two) Also do activity three, pp 55-56 of text and Exercises 1.1, 1.2 and 1.3 from Marden, et. al., pp 33-35. (Ex 1.1, 1.2 and 1.3 will be handed out to students on sep. sheets before lab.)

Lab. 2:

Activities 4 and 5, pp59-69 of text and Exercise 5.1, pp132-133 of Marden, et. al. (separate handout) will be done.

POPULATION--Lecture Outline.

I. Introduction: Unlike the case with many global issues, there is no "world population system". There are, by contrast, world food and energy distribution systems

II. Population in the U.S.A.--Six issues/results

III. Population Factors:

A. Process variables

B. Structural variables

C. $P^{now} = P^{then}$ + births - deaths + (inmigr. - outmigr.)

D. Age-sex distribution pyramids

IV. Trends in World Population

A. Growth

B. Growth/time relationships

C. Contrast of growth in developed and developing worlds

D. Rate of Growth

1. General trend since the 1950's

2. Contrast developed and developing world's rates (see fig. 2.6, p 35 of text)

3. The rule of 70

4. Present situation

E. Birth rates.

F. Death Rates.

V. Why is population growth an issue?

A. Demographic Transition Model

1. Model and its implications--see fig. 2.13, p 47 text.

2. Sweden, 1820-1970--see fig. 2.14, p. 47 of text.

3. Sri Lanka and Mexico, 1900/1930-present
--see fig 2.15, p 49 of text.

4. Contrast age composition of developing/poor countries with that of developed/wealthy countries.
--see fig 2.16, p 50 of text.

VI. Population plus"_____" Problems

A. Large population size + limited arable land =
food shortage, starvation, malnutrition

B. Large population size + Limited resource base =
Handicap to Improving Living Standard through Industr.

C. Rapid Pop. Growth +Low level of Economic Development
= Population "Stumbling Block" to Rapid Development

D. Very Young Population + Limited Public Funds =
Difficulties with Illiteracy, Health Conditions, Economy

E. Rapid Population Growth + Low Level of Industrialization
= Unemployment and Political Instability

VII Population Actors

A. Shapers of Global Action

1. International Actors--governmental and nongovernmental

a. International Governmental Organizations (IGO's)

b. International nongovernmental organizations

2. National Actors

a. U.S. govt. through AID

b. Other Western European national governments

c. Third World governments

3. Subnational Actors

4. Antinatalist vs. Pronatalist forces

B. The Targest of Global Action

1. International Actors: The Third World

2. Subnational Actors: Third World Couples

C Observers

VIII Population Values

A. Introduction

B. The Extreme positions
1. Pronatalist

2. Population Planning

C. The Moderate Alternatives
1. Developmentalist

2. Family Planning

IX Population Policy

A. Fertility Reduction Programs
1. Types of Programs
a. Population Planning

b. Family planning

2. Policies in the Third World

X. Population Futures:

A. The Art of Projecting the Future

1. Introduction

2. Available World Population Projections

B. From the Past to the Present to the Future

1. The recent past

2. Mortality in the Third World

3. Mortality in the Developed World

4. Fertility in the Developed World

5. Fertility in the Third World

6. International Migration

C. Projections of Population size and growth.

1. The World

2. The Third World and the Developed World

3. Major Regions

4. Countries

5. Conclusion

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